## Normal Hemodynamic Parameters – Adult

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>EQUATION</th>
<th>NORMAL RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arterial Oxygen Saturation (SaO₂)</td>
<td></td>
<td>95 - 100%</td>
</tr>
<tr>
<td>Mixed Venous Saturation (SvO₂)</td>
<td></td>
<td>60 - 80%</td>
</tr>
<tr>
<td>Central Venous Oxygen Saturation (ScvO₂)</td>
<td></td>
<td>70%</td>
</tr>
<tr>
<td>Arterial Blood Pressure (BP)</td>
<td>Systolic (SBP)</td>
<td>100 - 140 mmHg</td>
</tr>
<tr>
<td></td>
<td>Diastolic (DBP)</td>
<td>60 - 90 mmHg</td>
</tr>
<tr>
<td>Mean Arterial Pressure (MAP)</td>
<td>SBP + (2 x DBP)/3</td>
<td>70 - 105 mmHg</td>
</tr>
<tr>
<td>Right Atrial Pressure (RAP)/</td>
<td></td>
<td>2 - 6 mmHg</td>
</tr>
<tr>
<td>Central Venous Pressure (CVP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right Ventricular Pressure (RVP)</td>
<td>Systolic (RVSP)</td>
<td>15 - 30 mmHg</td>
</tr>
<tr>
<td></td>
<td>Diastolic (RVDP)</td>
<td>2 - 8 mmHg</td>
</tr>
<tr>
<td>Pulmonary Artery Pressure (PAP)</td>
<td>Systolic (PASP)</td>
<td>15 - 30 mmHg</td>
</tr>
<tr>
<td></td>
<td>Diastolic (PADP)</td>
<td>8 - 15 mmHg</td>
</tr>
<tr>
<td>Mean Pulmonary Artery Pressure (MPAP)</td>
<td>PASP + (2 x PADP)/3</td>
<td>9 - 18 mmHg</td>
</tr>
<tr>
<td>Pulmonary Artery Occlusion Pressure (PAOP)</td>
<td></td>
<td>6 - 12 mmHg</td>
</tr>
<tr>
<td>Left Atrial Pressure (LAP)</td>
<td></td>
<td>4 - 12 mmHg</td>
</tr>
<tr>
<td>Cardiac Output (CO)</td>
<td>HR x SV/1000</td>
<td>4.0 - 8.0 L/min</td>
</tr>
<tr>
<td>Cardiac Index (CI)</td>
<td>CO/BSA</td>
<td>2.5 - 4.0 L/min/m²</td>
</tr>
<tr>
<td>Stroke Volume (SV)</td>
<td>CO/HR x 1000</td>
<td>60 - 100 mL/beat</td>
</tr>
<tr>
<td>Stroke Volume Index (SVI)</td>
<td>CI/HR x 1000</td>
<td>33 - 47 mL/m²/beat</td>
</tr>
<tr>
<td>Stroke Volume Variation (SVV)</td>
<td>SVmax - SVmin/SVmean x 100</td>
<td>10 - 15%</td>
</tr>
<tr>
<td>Systemic Vascular Resistance (SVR)</td>
<td>80 x (MAP - RAP)/CO</td>
<td>800 - 1200 dynes - sec/cm²</td>
</tr>
<tr>
<td>Systemic Vascular Resistance Index (SVRI)</td>
<td>80 x (MAP - RAP)/CI</td>
<td>1970 - 2390 dynes - sec/cm²/m²</td>
</tr>
<tr>
<td>Pulmonary Vascular Resistance (PVR)</td>
<td>80 x (MPAP - PAOP)/CO</td>
<td>&lt;250 dynes - sec/cm²</td>
</tr>
<tr>
<td>Pulmonary Vascular Resistance Index (PVRI)</td>
<td>80 x (MPAP - PAOP)/CI</td>
<td>255 - 285 dynes - sec/cm²/m²</td>
</tr>
<tr>
<td>Left Ventricular Stroke Work (LVSW)</td>
<td>SI x MAP x 0.0144</td>
<td>8 - 10 g/m²</td>
</tr>
<tr>
<td>Left Ventricular Stroke Work Index (LVSWI)</td>
<td>SI x (MAP - PAOP) x 0.0136</td>
<td>50 - 62 g/m²/beat</td>
</tr>
<tr>
<td>Right Ventricular Stroke Work (RVS)</td>
<td>SI x MAP x 0.0144</td>
<td>51 - 61 g/m²</td>
</tr>
<tr>
<td>Right Ventricular Stroke Work Index (RVSWI)</td>
<td>SI x (MAP - CVP) x 0.0136</td>
<td>5 - 10 g/m²/beat</td>
</tr>
</tbody>
</table>
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<tr>
<td>Coronary Artery Perfusion Pressure (CPP)</td>
<td>Diastolic BP - PAOP</td>
<td>60 - 80 mmHg</td>
</tr>
<tr>
<td>Right Ventricular End-Diastolic Volume (RVEDV)</td>
<td>SV/EF</td>
<td>100 - 160 mL</td>
</tr>
<tr>
<td>Right Ventricular End-Diastolic Volume Index (RVEDVI)</td>
<td>RVEDV/BSA</td>
<td>60 - 100 mL/m²</td>
</tr>
<tr>
<td>Right Ventricular End-Systolic Volume (RVESV)</td>
<td>EDV - SV</td>
<td>50 - 100 mL</td>
</tr>
<tr>
<td>Right Ventricular Ejection Fraction (RVEF)</td>
<td>SV/EDV x 100</td>
<td>40 - 60%</td>
</tr>
<tr>
<td>Arterial Oxygen Content (CaO₂)</td>
<td>(0.0138 x Hgb x SaO₂) + 0.0031 x PaO₂</td>
<td>16 - 22 mL/dL</td>
</tr>
<tr>
<td>Venous Oxygen Content (CvO₂)</td>
<td>(0.0138 x Hgb x SvO₂) + 0.0031 x PvO₂</td>
<td>15 mL/dL</td>
</tr>
<tr>
<td>A - V Oxygen Content Difference (Ca - vO₂)</td>
<td>CaO₂ - CvO₂</td>
<td>4 - 6 mL/dL</td>
</tr>
<tr>
<td>Oxygen Delivery (DO₂)</td>
<td>CaO₂ x CO x 10</td>
<td>950 - 1150 mL/min</td>
</tr>
<tr>
<td>Oxygen Delivery Index (DO₂I)</td>
<td>CaO₂ x CI x 10</td>
<td>500 - 600 mL/min/m²</td>
</tr>
<tr>
<td>Oxygen Consumption (VO₂)</td>
<td>C(a - v)O₂ x CO x 10</td>
<td>200 - 250 mL/min</td>
</tr>
<tr>
<td>Oxygen Consumption Index (VO₂I)</td>
<td>C(a - v)O₂ x CI x 10</td>
<td>120 - 160 mL/min/m²</td>
</tr>
<tr>
<td>Oxygen Extraction Ratio (O₂ER)</td>
<td>(CaO₂ - CvO₂)/CaO₂ x 100</td>
<td>22 - 30%</td>
</tr>
<tr>
<td>Oxygen Extraction Index (O₂EI)</td>
<td>(SaO₂ - SvO₂)/SaO₂ x 100</td>
<td>20 - 25%</td>
</tr>
</tbody>
</table>

## Normal Blood Laboratory Values

<table>
<thead>
<tr>
<th>TEST</th>
<th>CONVENTIONAL UNITS (Reference Values*)</th>
<th>SI UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hematocrit (Hct)</td>
<td>Males: 42% - 52% Females: 36% - 48%</td>
<td>0.42 - 0.52 Females: 0.36 - 0.48</td>
</tr>
<tr>
<td>Hemoglobin (Hgb)</td>
<td>Males: 12.4 - 17.4 g/dL Females: 11.7 - 16 g/dL</td>
<td>124 - 174 g/L Females: 117 - 160 g/L</td>
</tr>
<tr>
<td>Lactate</td>
<td>0.93 - 1.65 mEq/L</td>
<td>0.93 - 1.65 mmol/L</td>
</tr>
</tbody>
</table>

*SI Units = International Units
*Reference Values vary by regional laboratory techniques and methods.

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